Reversible neurological complications from foam sclerotherapy

Commentary on Forlee MV et al.

Editorial

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It was with great interest that we read the study "Stroke after varicose vein foam injection sclerotherapy" (J Vasc Surg 2006; 43: 162-4) from Dublin which describes a neurological incident following foam duplex ultrasound-guided sclerotherapy of insufficiency of the V. saphena magna.

Following sclerotherapy carried out using a large quantity of foam (20 ml), a 61 year old patient suffered weakness in the right arm combined with slight aphasia which was reversible after 10 minutes. The weakness in the arm disappeared almost totally within the first few minutes and had completely disappeared at a check-up two weeks later. Known accompanying diseases were poorly managed diabetes mellitus type 1, arterial hypertonia, hypercholesterinaemia, bronchial asthma and migraine.

An immediate duplex examination of the carotids and a cerebral MRT were pathologically normal. Laboratory and 24 hour ECG were normal. The transoesophageal echocardiogram showed an 18 mm open foramen ovale with an associated atrial septum aneurysm.

For many years, every day all over the world, innumerable patients with varicose veins have been treated using foam sclerotherapy. To date there have been no other publications reporting cerebrovascular complications of this type in connection with this method of treatment (1, 2). The criticism by this study of foam sclerotherapy, a method which represents an important advance with regard to clinical efficacy and cost effectiveness in treatment of varicose veins, must be set against the entire body of research on this form of therapy in recent years (3-7).

The title of the publication alone, "Stroke following foam sclerotherapy" does not describe the patient's subsequently listed symptoms which, in German neurological language, corresponded to a reversible neurological deficit. The possibility of a vasospastic event (equivalent to a migraine), deemed more likely by "foam experts" than an embolic event, is not discussed. Also the MRT carried out immediately was pathologically normal. Migraine attacks with aura are also described and mainly following sclerotherapy of reticular varices using **liquid** sclerosants and could be attributed to a reactive vasospasm (8). An open foramen ovale is also associated with increased risk of migraine with aura (9).

An open foramen ovale switches off the filter function of the lungs thereby creating direct access from the venous system into the main circulation. This affects not only particles in terms of embolisation but also substances that are otherwise trapped by the lungs and rendered harmless.

The incidence of an open foramen ovale in the normal population is stated as less than 27% (9). Nick Morrison was able to show that after injecting 1-3 ml of sclerosing foam into small varices, there was evidence of foam as far as in the

right auricle but with an open foramen ovale under a Valsalva's manoeuvre it reaches the A. cerebri media. Using the listed small quantities among 7 patients with an open foramen ovale, each under a forcible Valsalva's manoeuvre, headache or temporary dizziness was observed but no other extensive neurological symptoms. A routine examination to eliminate an open foramen ovale before any sclerotherapy is therefore not deemed necessary (10).

Even in large-scale collective statistics central neurological events following application of foam are rare. In a recent French multi-centred study into complications with foam sclerotherapy among 6739 patients, only temporary visual disturbances were observed at an incidence of 0.28% (1). In an earlier prospective foam sclerotherapy study among 342 patients there were 2 cases of temporary visual disturbances (0.58%).

These symptoms were also observed with conventional sclerosants and after injecting small volumes. Nevertheless, it is plausible that injecting large volumes is linked to a higher rate of complications and could explain cerebral events with an open foramen ovale. In our view the amount of foam used in the case report by the Irish authors was unusually high.

Colleagues with a surgical background are used to treating varices patients in a single therapy session where possible. We know that this aim is often unrealistic with sclerotherapy and can only be achieved at the cost of a marked increase in the rate of adverse effects. For this reason there is an international tendency to use smaller quantities of foam as we recommended at our European Consensus Conference (2) back in 2003. Forlee et al have not followed these recommendations in that they used a foam volume of 20 ml, a volume that may even have exceeded the blood volume of the treated varicose vein. In view of the vasospasm of varices regularly occurring with foam sclerotherapy, a far smaller volume of foam would have sufficed. The maximum dose of foam recommended by the consensus conference of 6-8 ml per session is generally sufficient to adequately treat the V. saphena magna.

As, in the past, an increase in visual disturbances has been observed following application of thin and therefore unstable foams (Monfreux foam), our criticism is also aimed at the quality of the foam used. In the case described, Forlee et al used a 0.5% polidocanol foam which is highly unstable. Due to the rapid decomposition time large bubbles form within seconds of preparing the foam. However, it must be conceded that there are no details available on the manufacture of this 0.5% foam. It is possible that an entirely different blend ratio of air and sclerosing liquid was selected. Unfortunately, there are also no details of the position of the patient during the injection and of the subsequently recommended resting position for several minutes.

Furthermore, it is not just with foam sclerotherapy that there is evidence of gas bubbles in the right heart but also with other endovenous procedures such as LASER and VNUS closure (10). This is just by the by as the authors of the article do point out in an almost promotional way the supposed safety of the VNUS procedure, even mentioning the manufacturer.

In our view, in many cases foam sclerotherapy represents a good alternative to varicose vein surgery. With many indications (e.g. patients at increased risk from surgery, obese and elderly patients, recurrent varicose veins, ulcus cruris etc) it is better than surgery. Of all the endovenous methods it is by far the one with the lowest outlay in time and materials and therefore the cheapest therapy. Provided recommendations on dose and concentration of sclerosant are followed it is also very safe.

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